UNIVERSITY OF LIFE SCIENCES ”KING MIHAI I” FROM TIMISOARA
”YOUNG PEOPLE AND MULTIDISCIPLINARY RESEARCH IN APPLIED LIFE SCIENCES”
5-6 November 2026



Retrospective Analysis of Reproductive Indicators in Two Dairy Cattle Farms in Romania

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Abstract

The evaluation and continuous monitoring of reproductive performance are essential for effective dairy herd management. Reproductive indicators allow the detection of inefficiencies affecting herd productivity and profitability. The study analysed reproductive records from two dairy farms in Romania, comprising Holstein-Friesian (HF) and Romanian Spotted (RS) (Simmental-type) herds. Indicators included the number of services per pregnancy (NSP), service period (SP), calving interval (CI), and repeat breeder (RB) rate. NSP was calculated for confirmed pregnancies with documented insemination counts and RB rate was defined as the percentage of confirmed pregnancies requiring ≥3 inseminations. Mean NSP was 2.24 for 229 confirmed pregnancies in Holstein-Friesian and 1.66 for 190 in Romanian Spotted. Average SP was 120.05 days in Holstein-Friesian and 147.07 days in Romanian Spotted. CI averaged 398.39 days in Holstein-Friesian and 431.53 days in Romanian Spotted. In the complete dataset, operational RB rates were 31.44% (Holstein herd) and 18.42% (Romanian Spotted). Significant differences among herds were identified for NSP and SP, whereas no significant differences were found for CI or RB rate. Findings were interpreted considering herd management, observation periods, and record completeness. These indicators can guide management decisions to reduce repeated inseminations and prolonged intervals to conception, potentially improving farm economic efficiency.

Introduction

Reproductive efficiency affects dairy farm profitability. Animal health, environmental conditions, heat detection and insemination timing influence reproductive outcomes. Monitoring farm records allows the identification of inefficiencies and guides management decisions. This **retrospective study** evaluated the number of services per pregnancy (**NSP**), service period (**SP**), calving interval (**CI**) and repeat breeder (**RB**) rate in two Romanian dairy herds: one **Holstein-Friesian** and one **Romanian Spotted**.

Materials and methods

Reproductive records from Pantelimon (Holstein-Friesian, 2023–2026) and Satu Mare (Romanian Spotted, 2022–2026) were retrospectively analysed.

The RB rate represented confirmed pregnancies requiring **≥3** inseminations.

Descriptive analyses included all eligible cycles (HF and RS herds : NSP and RB rate: 229 and 190; SP: 265 and 58; CI: 266 and 17.

Statistical comparisons included the following numbers of eligible observations for the HF and RS herds, respectively: NSP: 227 and 81; SP: 236 and 44; CI: 175 and 9.

Mann–Whitney U and Pearson's chi-square tests were performed in Excel ($p < 0.05$).

Results and discussion

Herd	**NSP** ($\bar{x} \pm$ SD)	**SP - days** ($\bar{x} \pm$ SD)	**SP - days** ($\bar{x} \pm$ SD)
Holstein-Firesian -Pantelimon	**2.24** ± 1,46	**120.05** ± 73.51	**398.39** ± 73.41
Romanian Spotted-Satu Mare	**1.66** ± 1.06	**147.07** ± 57.77	**431.53** ± 56.04

Herd/References	**NSP** ($\bar{x}$)	**SP-days** ($\bar{x}$)	**CI - days** ($\bar{x}$)
Holstein [Vidu et al., 2025, Nistor-Anton and Maciuc, 2021]	**1.92**	**87.96–89.24**	**395.85–459.51**
Romanian Spotted [Cighi et al., 2021; Cziszter et al., 2017]	**1.78-1.90**	**122.00-138.30**	**385.80-421.54**





Holstein-Friesian vs. Romanian Spotted (2023–2025): NSP was significantly higher in Holstein-Friesian cows ($p = 0.0015$), while SP was significantly longer in Romanian Spotted cows ($p < 0.001$). Insemination count distributions differed significantly between herds ($p < 0.001$), whereas differences in CI ($p = 0.0503$) and RB rate (31.28% vs. 22.22%; $p = 0.1227$) were not significant. Single-farm representation limits breed-related conclusions.

Conclusions

The Holstein-Friesian farm showed a significantly higher NSP compared with the Romanian Spotted farm, whereas SP was significantly longer in the Romanian Spotted farm. Differences in CI and operational RB rate between farms were not statistically significant. Assessing insemination requirements alongside reproductive intervals can support herd monitoring. Incomplete records and the inclusion of only one farm per breed limit interpretation, highlighting the need for consistent recording and prospective assessment.

Acknowledgments: The authors thank the farmers and veterinarians involved in the study for their collaboration, access to farm records and facilities, and support during data collection. The authors also acknowledge the Department of Reproduction, Faculty of Veterinary Medicine, University of Life Sciences "King Mihai I" from Timişoara, for its technical assistance and scientific guidance during the preparation of this work.